## REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

Claims 118, 128 and 129 have been amended to overcome the 35 USC 101 rejection. Withdrwal of this rejection is deemed to be warranted.

Claims 79, 81, 82, 86, 88-93, 95-97, 100, 102, 103, 107-111, 118, 120-123, 128 and 129 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Terry et al (US Pub. No. 20050249133) in view of Jorgensen (US Pub. No. 2007/0073805) and Schultz et al. (WIPO WO 01/63855 A1). Claims 83, 84, 99, 113, 124 and 125 stand rejected under 35 U.S.C. § 103(a) as being unpatenable over Terry in view of Jorgensen and Schultz, as applied to claims 79 and 100 above, and further in view of Lucent-3GPP ("Scheduled and Autonomous Mode Operation for the Enhanced Uplink," 2003, 3GPP TSG RAN WG1#31 R1-03-0284). Claims 85, 87, 104 and 105 stand rejected under 35 U.S.C. § 103(a) as being unpatenable over Terry in view of Jorgensen and Schultz, as applied to claims 79 and 100 above, and further in view of Fujitsu-3GPP TSG RAN1 and RAN2. Claims 98 and 112 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Terry in view of Jorgensen and Schultz, as applied to claim 79 above, and further in view of Cheng et al (US Pub. No. 2004/0228313 A1). The Applicants respectfully traverse these rejections as follows.

It is respectfully submitted that the rejection of claim 79 should be withdrawn for at least the following reasons.

Claim 79 recites:

> *"A method for scheduling transmissions of mobile terminal in a mobile communication system, the method comprising:*

*receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows to be multiplexed onto a single dedicated uplink channel by the mobile terminal,*

*receiving a scheduling request from the mobile terminal at the base station, wherein the scheduling request (i) comprises an identifier identifying one flow of the plurality of flows and (ii) requests allocation of an uplink resource to the mobile terminal for transmitting data of said plurality of flows to be multiplexed onto the dedicated uplink channel,*

*determining, based on the identifier within the scheduling request, the QoS attributes associated with the flow identified by the identifier within the scheduling request, and*

*scheduling by the base station the uplink resource for transmission of data of said plurality of flows to be multiplexed onto the dedicated uplink channel by said mobile terminal, based on the identifier identifying said one flow of said plurality of flows and said QoS attributes that are determined by said determining operation and that are associated with the flow identified by the identifier within the scheduling request."*

The invention of claim 79 provides a solution, involving a scheduling request that relates to multiple flows that are to be multiplexed in an uplink transmission, while this single scheduling request relating to multiple flows includes a flow identifier of one flow of the multiple flows. The base station schedules the uplink resource for data transmission of the multiple flows based on the identifier of the one flow and the determined QoS attributes associated with the one flow identified by the identifier.

Applicants acknowledge that page 16, lines 3-14 of the response of June 7, 2010 contained a typo relating to erroneously referred to Terry et al. with respect to the feature of:

*"determining based on the identifier within the scheduling request the QoS attributes associated to the flow identified by the identifier in within the scheduling request".*

With respect to this subject matter, the Applicants submit that the reference in the Office Action at page 7, line 20 through page 8, line 4 to Fig. 15A and Fig. 15B of Jorgensen is not on point because these figures are directed to downlink IP analyzer 602 and downlink flow scheduler 604 (see, Jorgensen's paragraph [0491]), whereas the instant

claimed subject-matter relates to scheduling of uplink transmissions *("scheduling request [...] (ii) requests allocation of an uplink resource to the mobile terminal for transmitting data of said plurality of flows to be multiplexed onto the dedicated uplink channel").* Attention is directed to paragraphs [0397], [0398], [0406] to [0411] of Jorgensen, all referring to the operation of the downlink IP analyzer 602 and the downlink flow scheduler 604.

Regarding uplink transmission (in terms of scheduling requests and scheduling), the passage in paragraph [0400] to paragraph [0402] of Jorgensen gives an overview of the uplink IP flow analyzer 632 and uplink IP flow scheduler 634, which - as their names suggest - relate to the scheduling of uplink transmissions by "uplink flow scheduler 634 at wireless base station 302 based on classification information provided to the wireless base station 302 through an uplink IP flow reservation request from the CPE station" (see paragraph [0425]). The "uplink IP flow reservation request from the CPE station" corresponds to the "reservation request blocks" shown in Fig. 12K (see paragraphs [0427] and [0463] to [0465]).

Fig. 16A and Fig. 16B of Jorgensen show logical flow diagrams for the uplink and pertain to analysis and scheduling of shared wireless bandwidth to IP packet flows from a subscriber workstation 120d coupled to a subscriber CPE station 294d, being transmitted over the wireless medium up to the wireless base station 302, and on to data network 142 for transmission to a destination host workstation 136a. Fig. 16A is an exemplary logical flow diagram 1600 for uplink IP flow analyzer 632, and Fig. 16B is an exemplary logical flow diagram 1660 for the uplink flow scheduler 634 (see paragraph [0539]).

The scheduling of the transmissions is discussed with respect to Fig. 13 and Fig. 14 of Jorgensen (see paragraph [0531] in the context of Fig. 15A and Fig. 15B and

downlink scheduling, and paragraph [0547] in the context of Fig. 16A and Fig. 16B and uplink scheduling; see also paragraph [0478]).

Paragraph [0482] describes the scheduling mechanism for uplink transmissions based on class-based queuing (see also paragraph [0136] and paragraph [0488], last sentence): The reservation requests for future upstream slots (see Fig. 12K) arrive at wireless base station 302 as part of the current upstream subframe 1204 received from CPE subscriber stations 294 over the wireless medium. Current upstream subframe 1344 can temporarily store reservation requests for analysis and scheduling of uplink packets. The reservation request blocks (RRBs) include a request for a number of slots for a single IP flow with an IP flow identifier # and class of the flow. The upstream reservation requests (by IP flow and class) are queued onto class 1 upstream reservation request queue 1308, class 2 upstream reservation request queue 1310, and class 3 upstream reservation request queue 1312 by an IP flow QoS class queuing processor (described below with respect to FIGS. 16A and 16B). Flow scheduler 604 and 1566, and 634 and 1666, use these downstream reservations and upstream reservation requests to assign slots to data packets in the next downstream transmission subframe 1202 and upstream transmission sub frame 1204, respectively.

The Office Action argues that Jorgensen suggests that the (flow) identifier comprised within the scheduling request is used to determine the QoS attributes associated to the flow identified by the identifier within the scheduling request. This however appears to be incorrect.

The Applicants submit that it is very important to understand the concept that Jorgensen assumes for scheduling: There is a per-IP flow scheduling based on per-IP flow reservation request blocks (RRBs). This can be confirmed in paragraph [0482]

discussed above mentioning that the RRBs "include a request for a number of slots for a single IP flow with an IP flow identifier # and class of the flow" and "upstream reservation requests (by IP flow and class)". Also, this is confirmed by paragraph [0466] which states that "[r]eservation request slots can be provided on an IP flow basis."

Hence, in the Jorgensen scheme for each single IP flow a respective reservation request block (RRB) is sent.

Furthermore, it is apparent from Jorgensen that the IP flow identifier is not used for identifying QoS parameters in scheduling. Instead, as shown in Fig. 12K and as also described in paragraphs [0463] to [0465], the RRB 1216 comprises an IP flow identifier 1234c and a quality of service data class 1244a.

Hence, upon receipt of a RRB 1216 for a given IP flow (identified by its IP flow identifier 1234c), the uplink flow scheduler 634 will schedule the CPE station "based on classification information provided to the wireless base station 302 through an uplink IP flow reservation request from the CPE station" (see paragraph [0425]). The uplink flow scheduler 634 thus uses the information on the quality of service data class 1244a comprised within the RRB 1216 for scheduling.

This can be confirmed in various further passages in Jorgensen. For example paragraph [0425] mentioned above expressly states:

> "1"...] *the scheduling function is performed at uplink flow scheduler 634 at wireless base station 302 based on classification information provided to the wireless base station 302 through an uplink IP flow reservation request from the CPE station".*

Similarly, paragraph [0547] states:

> *"Each time a subscriber CPE station 294d attempts to communicate in the uplink direction with wireless base station 302, it requests* a *reservation by*

*inserting an RRB in the uplink subframe. Uplink frame scheduler 634 then schedules the reservation request in a future uplink subframe and notifies the CPE station 294d of the reservation. In a downlink signal, uplink flow scheduler 634 located preferably at wireless base station 302, transmits a reservation slot in a particular future frame for the requesting subscriber CPE station 294d to transmit its uplink data. Uplink flow scheduler 634 assigns the reservation based on the same parameters as the downlink flow scheduler 604 uses in the downlink. In other words, uplink flow scheduler 634 determines the reservation slots based on the queue class priority and based on a set of rules, schedules the reservations for uplink transmissions from subscriber CPE station 294d using, e.g., an advanced reservation algorithm."*

Hence, the IP flow identifier 1234c in RRB 1216 merely identifies the "IP data flow" (see paragraph [0471]) and is used for acknowledging the reception of an RRB 1216 for a given IP flow identified by the IP flow identifier 1234c in the RRB 1216 (see paragraphs [0453] and [0454]).

As is apparent from this summary of Jorgensen, the IP flow identifier 1234c in RRB 1216 is not used for

*"determining based on the [flow] identifier within the scheduling request the* QoS *attributes associated to the flow identified by the identifier in within the scheduling request"*

as recited in the instant independent claims.

Furthermore, this feature would not have been not obvious to a skilled person from Jorgensen. In contrast to Jorgensen, the instant claimed invention assumes a scenario, where one scheduling request is sent for multiple flows (that are to be multiplexed in the uplink transmission), while this single scheduling request indicates the flow identifier of one of the multiple flows.

Even if it were assumed *arguendo* that Terry et al. teach multiplexing of flows, the straightforward application of Jorgensen would at most teach including for each uplink flow to be multiplexed the corresponding IP flow identifier 1234c and its respective quality of service

data class 1244a in the scheduling request, i.e. to include the flow identifiers of all of the multiple flows and their respective QoS classes to the scheduling request. To allow consideration of the QoS parameters of the respective flows in scheduling. This is however still distinct from the invention.

The Office Action cites (see page 8, last paragraph, through page 9 of the Office Action) Schultz et al. as showing the feature of:

> *"receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows to be multiplexed by the mobile terminal onto a single dedicated uplink channel"*

In this respect we argued in our last submission that Schultz et al. states that the MAC layer (i.e. the MAC-d element and the MAC-e element) is implemented (and terminated) in the UE and RNC (see Fig. 2 of Schultz et al.), which implies that the RNC is not signaling the QoS attributes to the base station (Node B). Furthermore, since the MAC layer implements the scheduling function (see page 29, lines 10 to 20), there is no reason to assume that the Node B would need to be informed on the QoS attributes of the flows, since the Node B only implements Physical layer functionality, as shown in Fig. 2.

In this regard, the Office Action now states at page 3, lines 21-22 that "a base station or Node B has to have a MAC layer as one of its protocol stack" and this would be fundamental knowledge, as for example shown in Shultz et al., page 28, line 10 and lines 15 to 17.

This statement appears to reflect a misunderstanding of the Applicants' argument in the previous Response. The MAC layer may be considered a generic term for a collection of functions that are typically attributed to medium access control (MAC). However, which

functions are to be implemented in the MAC layer depends on the particular communication system considered.

For the instant claimed subject-matter, it appears decisive what Schultz et al. teaches with respect to the scheduling function of the MAC layer, as the claims require that the QoS attributes received at the base station are used in scheduling uplink transmissions and Schultz et al. recites to the MAC layer to perform the scheduling based on RAB parameters, in particular the QoS class of the logical channels (see Fig. 8 and page 29, lines 10 to 20; Fig. 2 and page 7, lines 14 to 16 and lines 19 to 25; also Fig. 3, ref. nos. 305, 315, 320).

As shown in Fig. 2 and as stated on page 7, lines 14 to 16 and lines 19 to 25 of Schultz et al., the MAC-c element performs the scheduling function and this MAC-c element is located in the RNC. This implies that the operation of the scheduling function described on page 29, lines 10 to 20 of Schultz et al. is performed by the RNC, and not the Node B. Furthermore, Fig. 2 shows the protocol model (and protocol termination entities) of the communication system assumed in Shultz et al. In this protocol model, the Node B is assumed to implement only a "Physical layer" (PHY), i.e., implements only protocols the functions of which are considered to belong to the physical layer (i.e. Layer 1 of the OSI model). Hence, also Fig. 2 makes clear that the scheduling function of the MAC is not located in the Node B.

Since the scheduling function of the MAC-e element in Schultz et al. is implemented in the RNC, Schultz et al. cannot show the above-noted feature of claim 79 of receiving at the base station from a radio network controller Quality of Service (QoS) attributes. Hence, the allegation in the Office Action that a "base station or Node B has to have a MAC layer as

one of its protocol stack" appears incorrect and it appears further not of any necessary to "distinguish" the MAC layers in the claimed subject matter contrary to the statement in the Office Action.

Accordingly, it is submitted that even if the teachings of Terry et al., Jorgensen, and Schultz, were combined as proposed in the Office Action, the result still would lack the above-noted subject matter of claim 79, and thus, claim 79 is not rendered obvious by these references. Claim 100 is a counterpart apparatus claim and claim 118 is a counterpart computer-readable storage medium claim to method claim 79, and these claims are allowable for at least the above-noted reasons that claim 79 is allowable. The dependent claims are allowable due to their dependence from an allowable independent claim and also due to their recitation of subject matter that provides an independent basis for their individual allowability.

In light of the foregoing, it is submitted that all pending claims are directed to allowable subject matter, and a notice of allowance is respectfully requested.

If any issues remain which may best be resolved through a direct communication, the examiner is requested to e-mail the undersigned at the address listed below.

Respectfully submitted,

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